

September 3, 2002

MEMORANDUM TO: Theodore R. Quay, Chief  
Equipment and Human Performance Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation

FROM: */RA/*  
David C. Trimble, Chief  
Operator Licensing and Human Performance Section  
Equipment and Human Performance Branch  
Division of Inspection Program Management  
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE JULY 17, 2002, PUBLIC MEETING TO DISCUSS  
THE DEVELOPMENT OF A PROPOSED WORKER FATIGUE RULE

On July 17, 2002, the staff held the fourth in a series of public meetings regarding the development of a proposed rule concerning worker fatigue at nuclear power plants. The rulemaking has been proposed as an amendment to 10 CFR 26, "Fitness for Duty Programs." The meeting participants (see Attachment 1) included representatives from the Electric Power Research Institute (EPRI), The Institute for Nuclear Power Plant Operations (INPO), the Nuclear Energy Institute (NEI), the Professional Reactor Operator Society, the National Institute of Occupational Safety and Health (NIOSH), the National Sleep Foundation (NSF), the Union of Concerned Scientists (UCS), individual utilities, and members of the public. The meeting agenda is contained in the staff's presentation materials provided as Attachment 2.

The focus of the meeting discussion was on the scope of personnel that should be covered by the proposed requirements to address worker fatigue. There was general agreement among stakeholders that the training, behavioral observation, and self-declaration elements of a fatigue management program would apply to all personnel at nuclear plants subject to 10 CFR 26 fitness for duty programs. It was also generally agreed that the proposed requirements concerning work scheduling controls would apply to a limited set of job functions and consequently not all individuals within a licensee's fitness-for-duty program would be subject to work scheduling restrictions. In this regard, NEI provided the following recommendation:

The work hours section of Part 26 would apply to those plant personnel who are directly working on safety-related structures, systems and components as outlined in 10 CFR 50.2, in the capacity of operators, maintenance workers (predictive, preventative, corrective), and key plant security workers who are required to remain alert.



Plant personnel who, during the course of a work period, perform a mix of safety and non-safety-related work will have all work hours counted toward work-hours totals since all hours can impact alertness relative to safety-related performance.

Discussion of this proposal resulted in the following clarifications and agreements among the meeting participants.

The term “plant personnel” includes licensee employees and contract/vendor personnel working on site. It was generally agreed that the word “plant” could be removed from the scope statement given the remainder of the statement provides adequate clarification that the requirements would not apply to off-site personnel.

The phrase “directly working on” was discussed at length. It was generally agreed that the intent was to limit the scope to hands-on work and the direct supervision of that work. Direct supervision was understood by the staff to mean providing direction or oversight of the actual work.

In reference to the phrase “safety-related structures, systems and components as outlined in 10 CFR 50.2,” the NRC staff proposed that the scope of equipment referenced should be risk-informed. The staff proposed that the scope be limited to structures, systems and components that a risk-informed evaluation process has shown to be significant to public health and safety. The staff noted that such a scope of equipment had already been defined on a plant specific basis for compliance with paragraph (a)(4) of 10 CFR 50.65, “Requirements for monitoring the effectiveness of maintenance at nuclear power plants.” NEI agreed to evaluate the feasibility of using such a scope of equipment for determining which functions should be subject to work scheduling controls. Participants also generally agreed that activities involving direct work on security equipment should be evaluated for specific reference in the scope statement and addressed at a later meeting.

There was general consensus among meeting participants that the work scheduling controls should apply to operations and maintenance personnel as defined by the scope statement.

NEI stated that they had not yet defined “key plant security workers” for the purposes of the scope statement. The staff proposed that as a minimum, NEI consider (1) armed responders, (2) system operators, (3) the security shift supervisor, and (4) security workers performing compensatory measures as “key” security workers. NEI agreed to review these functions and provide clarification concerning this part of the scope statement.

The staff noted that during the meeting stakeholders made reference to the ability of workers to remain “alert” and that this criterion was specifically applied to security personnel. The staff noted that fatigue can affect other cognitive functions (e.g., decision making) and that the staff concerns were not limited to decrements in a worker’s ability to remain vigilant.

There was general agreement among participants with the proposal that all work hours for personnel who perform a mix of safety-related and non-safety related activities should be counted toward work hour totals.

Regarding health physicists and health physics technicians, it was generally agreed that work scheduling controls should apply to work performed by these individuals consistent with the scope statement NEI proposed for operations and maintenance personnel.

Participants discussed the functions of the on-shift health physics and chemistry personnel as emergency responders, as well as the functions of personnel reporting to the Technical Support Center (TSC) and Emergency Operations Facility (EOF) as potential functions which may warrant work scheduling controls. The objective would be to provide assurance that, should an emergency occur, emergency responders would be fit for duty. Although there was general agreement that work scheduling limits should not be imposed during the initial phases of an emergency, no clear consensus emerged concerning routine scheduling controls for personnel that may be called upon to perform these functions. The NRC staff and NEI agreed to review the functions performed by these personnel, and evaluate the sensitivity of these functions to fatigue related errors. Participants agreed to discuss the scope statement relative to these functions at a future meeting.

In addition to scope, participants discussed an NEI proposal for work scheduling limits. The proposed limits are provided within Attachment 3. The proposal included work schedule controls for (1) planned outage work hours and (2) non-outage work hours. The focus of the discussion was on the proposed controls for planned outages. The NEI proposal for planned outage thresholds states:

During outages, an extended work schedule of 12-hour days may be used. An individual will not exceed 16-hours in any 24-hour period, excluding turnover time, and will have a minimum of 10 hours off between work periods.

The staff noted that the proposed controls would not set an upper limit on the number of consecutive 12-hour shifts that an individual worked. The staff expressed concern that such a proposal presented the potential for cumulative fatigue and provided inadequate consolidated rest periods. The staff noted that this proposal was similar to NEI's previous proposal, except that it eliminated the one day of rest in 14 days suggested previously. The staff noted that the previous proposal appeared to provide inadequate consolidated rest periods and that the current proposal exacerbated this concern by eliminating provisions for days off entirely. The rationale offered for the current proposal was that a single day off could be detrimental for individuals working night shifts because they tend to revert to day schedule when they are not working. It became evident through discussion that the perceived benefit of eliminating the day off was dependent on the assumption that, during an outage, individuals would remain on a fixed day or night shift and that the outage would be of limited duration. The staff noted reluctance to adopt requirements that assumed or required a single approach to scheduling. The staff also noted that the proposal did not directly limit the frequency of 16-hour shifts, but rather assumed that licensees would limit the frequency of these instances because of the requirement for a minimum 10 hour break and the practical difficulty of scheduling personnel on any basis other than a 24-hour clock.

The NEI proposal included guidance for non-outage work hour thresholds and monitoring of program performance but insufficient time was available to discuss these items substantively. The staff concluded the meeting by setting August 22, 2002, as the date for the next public meeting to address unresolved items from this meeting and further discuss development of the proposed rulemaking.

Attachments: As stated

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Attachments: As stated

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Public Meeting to Discuss Development of a Proposed Rule Concerning  
Worker Fatigue at Nuclear Power Plants

July 17, 2002

Attendance List

NAME	AFFILIATION
Jim Wigginton	NRC
Robert Meyer (by teleconference)	Professional Reactor Operator Society
Wayne Scott	NRC
Roger Rosa	NIOSH, CDC
Dave Lochbaum	Union of Concerned Scientists
Craig K. Seaman	APS-PV
R.D. Mothene	FPL
Bryan Dolan	Duke Energy
Ned Tyler	Constellation Energy
James Gallman	TXU
David Shafer	Amergen UE
Ralph Mullis	Progress Energy
Robert Evans	NEI
David Kulisek	TVA - Watts Bar
Mark Burzynski	TVA
David Desaulniers	NRC
Gerald Ellis	Exelon
David Ziebell	EPRI
Sandra Frattali	NRC
Charlie Brooks	INPO
Clare Goodman	NRC
Scott Phillips	National Sleep Foundation
Deann Raleigh	US Sciencetech
Brad Baxter	NRC

NAME	AFFILIATION
John Fee	Souther California Edison
J. Persensky	NRC
David Trimble	NRC
Martin Humphrey	FENOC
Robert Moody	NRC
Saurabh Desai	National Sleep Foundation
Jenny Weil	McGraw-Hill
Chip Cameron	NRC